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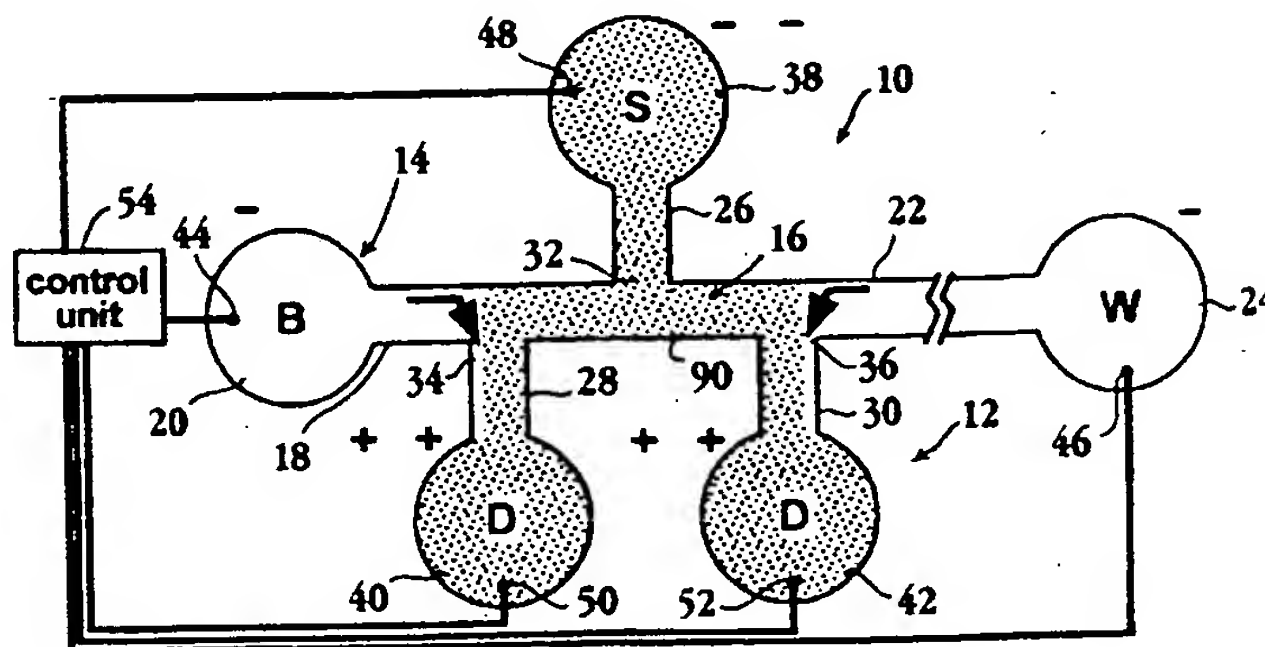
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(54) Title: MICROFLUIDIC DEVICE WITH SAMPLE INJECTOR AND METHOD OF USE



(57) Abstract: A method and device for injecting a liquid sample into an electrolyte channel in a microfluidics device is disclosed. The device has a channel network that includes an electrolyte channel having upstream and downstream channel portions and first, second, and third side channels that intersect the electrolyte channel between the two channel portions at first, second, and third ports, respectively. In the method, a sample is moved electrokinetically into the electrolyte channel, to form a defined sample volume therein. By simultaneously controlling the voltage applied to the three side channels, and at least one of the upstream and downstream channel end portions, the sample volume element can be shaped to have a desired leading- and trailing-edge shape and/or distribution of sample components within the volume elements.

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*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

## INTERNATIONAL SEARCH REPORT

International Application No.

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A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 G01N27/447

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98 49548 A (BOUSSE LUC ;DUBROW ROBERT S (US); KENNEDY COLIN B (US); CALIPER TE) 5 November 1998 (1998-11-05)	1-5, 13, 14
Y	the whole document	6, 8, 10-12, 16-19
Y	US 5 869 004 A (KOPF-SILL ANNE R ET AL) 9 February 1999 (1999-02-09) column 3, line 3 - line 17; figures	10-12, 18, 19
Y	PIER GIORGIO RIGHETTI (ED): "Capillary electrophoresis in analytical biotechnology" 1996, CRC PRESS, NEW YORK XP008002033 cited in the application page 84 -page 87	6, 8, 16, 17
	-/-	

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 599 432 A (MANZ ANDREAS ET AL) 4 February 1997 (1997-02-04) column 1, line 10 -column 2, line 51; figures column 3, line 35 - line 57 ---	1-19
A	US 5 858 195 A (RAMSEY J MICHAEL) 12 January 1999 (1999-01-12) column 3, line 1 -column 4, line 34; figures ---	1-19
A	US 5 858 187 A (RAMSEY JOHN MICHAEL ET AL) 12 January 1999 (1999-01-12) column 1, line 11 - line 18; figures 1,2 ---	1

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9849548	A	05-11-1998	US 5976336 A	02-11-1999
			AU 727083 B2	30-11-2000
			AU 7115498 A	24-11-1998
			CN 1253625 T	17-05-2000
			EP 0988529 A1	29-03-2000
			JP 2001523341 T	20-11-2001
			WO 9849548 A1	05-11-1998
			US 6235175 B1	22-05-2001
			US 6068752 A	30-05-2000
			US 6153073 A	28-11-2000
US 5869004	A	09-02-1999	AU 732462 B2	26-04-2001
			AU 8255198 A	30-12-1998
			EP 0988110 A1	29-03-2000
			WO 9856505 A1	17-12-1998
			US 6004515 A	21-12-1999
			US 6149870 A	21-11-2000
US 5599432	A	04-02-1997	EP 0653631 A2	17-05-1995
			JP 7198680 A	01-08-1995
US 5858195	A	12-01-1999	US 6001229 A	14-12-1999
			US 6010607 A	04-01-2000
			US 6010608 A	04-01-2000
			US 6033546 A	07-03-2000
			AU 701348 B2	28-01-1999
			AU 3150895 A	04-03-1996
			CA 2196429 A1	15-02-1996
			CN 1168720 A , B	24-12-1997
			EP 1162455 A1	12-12-2001
			EP 0775306 A1	28-05-1997
			JP 10507516 T	21-07-1998
			WO 9604547 A1	15-02-1996
			US 6342142 B1	29-01-2002
			US 2002008030 A1	24-01-2002
US 5858187	A	12-01-1999	US 6120666 A	19-09-2000